



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/880,715	06/12/2001	Thomas L. Ritzdorf	SEMT117192	7384
7590	12/30/2003		EXAMINER	
KEITH V. ROCKEY BELL, BOYD & LLOYD LLC 70 WEST MADISON STREET SUITE 3300 CHICAGO, IL 60602			LEADER, WILLIAM T	
			ART UNIT	PAPER NUMBER
			1742	
			DATE MAILED: 12/30/2003	

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/880,715	RITZDORF ET AL.
	Examiner William T. Leader	Art Unit 1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 06 October 2003.

2a) This action is FINAL.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 54-59 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 54-59 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) All    b) Some \*    c) None of:  
     1. Certified copies of the priority documents have been received.  
     2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
     3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    \* See the attached detailed Office action for a list of the certified copies not received.

13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

    a) The translation of the foreign language provisional application has been received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1) Notice of References Cited (PTO-892)      4) Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)      5) Notice of Informal Patent Application (PTO-152)  
 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.      6) Other: \_\_\_\_\_

DETAILED ACTION

1. Receipt of the response filed on October 6, 2003, is acknowledged. Claims 32-53 were canceled in the amendment faxed to the PTO on February 10, 2003. Claims 54-59 are pending. The amendment to claim 56 has overcome the objection of record.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

*Claim Rejections - 35 USC § 103*

3. Claims 54-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dubin et al (US 5,972,192) or Poris (US 5,256,274) in view of the Lowenheim text *Electroplating* and Ameen et al (US 5,685,970) for the reasons given in the previous office action and in view of the following comments.
4. Applicant's Remarks have been carefully considered but are not deemed to be persuasive. At page 14 of the Remarks, applicant observes that Dubin and Poris fail to teach the step of increasing the current flow and notes that the Examiner relies on the secondary references, namely the Lowenheim text and the Ameen patent, for teaching of the concept of low current density initiation followed by higher current density for the bulk of the plating. Applicant urges that the Lowenheim text is a general textbook, and is concerned with such plating

operations as depositing an electrically conductive film onto a nonconductive surface such as plastic, and that the Ameen plastic is similar. Applicant concludes that there is no suggestion in the art to combine teaching of the secondary references with those of the primary references. This conclusion is considered to be incorrect. For the reasons given in the previous office action, the secondary references make clear the rationale for beginning a process of electroplating onto a substrate having a limited current carrying capacity at a low current density and subsequently increasing the current density. The advantages include the avoidance of burning the initially deposited seed layer by using a low current density at the beginning of the process, and the ability to shorten the time required to form the desired deposit thickness by increasing current density once the substrate has the ability to accept greater amounts of current.

5. At page 15 of the Remarks, applicant notes that the independent claims define conditions after which the higher current density is applied such as "after a combined thickness of the seed and plated layers has reached a predetermined value" and "after a predetermined time". The claim limitation related to a predetermined value of thickness is considered to include all values of thickness after electroplating has begun, while the claim limitation related to "predetermined time" is considered to include all periods of time after the beginning of electroplating. The references of record suggest that electroplating current density should be increased after a period of time during which the current-carrying

Art Unit: 1742

capacity of the seed layer has been increased. This teaching suggests the limitations referred to by applicant.

6. Applicant additionally point to claims limitations reciting that the second current density is "substantially greater". The Lowenheim reference sets forth Faraday's Laws which are the fundamental relationships followed by electrochemical processes. The first law states that the amount of chemical change produced by an electric current is proportional to the quantity of electricity that passes. Based on this law, one of ordinary skill in the art would have recognized that plating time is inversely proportional to current density, and that the use of a substantially increased current density would have resulted in a substantially shortened plating time increasing efficiency and productivity.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will

the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 571-272-1244.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

ROY KING  
SUPERVISORY PATENT EXAMINER  
TECHNICAL DIVISION 1700

WT  
William Leader  
December 22, 2003